STS 24

Computational Sciences and Artificial Intelligence in Industry (CSAI) – New Digital Technologies for Solving Future Industrial, Societal and Economical Challenges

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Session Abstract

Keywords: *Digital revolution, data Algorithms, Computational applied mathematics, Artificial Intelligence, Machine learning and deep learning, Computational intelligence, Emerging technologies*

The objective of this Special Technology Session is to be a forum of presenting and discussing the recent research, innovation and ideas in the bridged areas of Computational Sciences and Artificial Intelligence (AI). A special area of interest is the application of these scientific fields to the industrial sector and real-life problem solving.

AI of the future will mean creating the greatest values for all stakeholders: industry, services and users. To achieve this, the industry will have to be connected, and this is already a reality today. Progress is central to such change, made possible by the digital revolution. The Internet of Things, the Cloud and Big Data are an integral part of the industry's transformation as they gain momentum, affecting every aspect of society.

The world of data algorithmics with Computational Sciences is improving performance and productivity in several industrial sectors. The proliferation of sensors installed on complex systems found at every level of industry help both to fine-tune service in real time and to regulate all production sequences at the highest possible level. All stakeholders in the industry and society sectors are now up to speed with the digital age. Connected industry is hastening the pace of transformations that are already underway.

But this comes at a price. All connected objects, soon to be linked to developments in Artificial Intelligence, are potential points of entry for digital attacks. Improved performance has the paradoxical effect of increasing exposure to cyber threats. Cyber-attacks can exploit the logics of networks, spreading to contaminate the most established industrial systems, such as social networks and governmental systems.

This is a topic of utmost importance, since the progress achieved in connected industry and society is so great that no one can imagine any going back.

The pace and continuity of innovation relies largely on the confidence placed in the data generated and systems that suspend them. Security is now a major issue for the sustainability of states, smart territories and businesses. The rapid increase in surface and air transport, medicine and finance sectors, among others, is the most tangible demonstration of the above issue.

The following papers will be presented:

Lessons Learnt from the CSAI 2019 Conference: Combining Computational Sciences and Artificial Intelligence
Tero Tuovinen, Pekka Neittaanmäki, Univ. Jyväskylä, Finland, Jacques Periaux, CIMNE, Barcelona, Spain

Fast Aerodynamic Predictions Using Neural Networks
Kensley Balla, Ruben Sevilla, Oubay Hassan, Kenneth Morgan, Swansea Univ. Swansea, UK

Automatically Created Parsimonious Neural Networks
Houcine Turki, Mohamed Masmoudi, ADAGOS, Ramonville-Saint-Agne, France

< Title tbd. >
Trond Kvamsdal, NTNU and SINTEF, Trondheim, Norway